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EXAMINER
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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 10, 11, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruch et al. (US 6517184 B1) in view of Barbour et al. (US 6476928 B1).

#### **Bruch et al. disclose the following claim limitations:**

As per claim 1: a housing having an array of nozzles (figure 4, elements 400 and 410); data stored in the printhead memory, said data being indicative of a location of at least one missing or malfunctioning nozzle of said array of nozzles (column 9, lines 47-64 and column 14, line 63-column 15, line 5) (the numbers correspond to specific nozzles).

As per claim 4: the printhead is adapted to be installed into a printer having firmware capable of reading said data from said printhead memory (column 14, line 63-column 15, line 5).

As per claim 5: the printer is adapted to use said data to format print jobs (column 14, line 63-column 15, line 5).

As per claim 6: providing a printhead having a housing including an array of nozzles (figure 4, elements 400 and 410) and storing data in a printhead memory, said data being indicative of a location of at least one missing or malfunctioning nozzle of said array of nozzles (column 9, lines 47-64 and column 14, line 63-column 15, line 5) (the numbers correspond to specific nozzles).

As per claim 10: the step of installing said printhead having firmware capable of reading said printhead memory (column 14, line 63-column 15, line 5).

As per claim 11: the firmware reads said printhead memory and a formatter formats a print job based on the data (column 14, line 63-column 15, line 5).

As per claim 13: the storing step includes performing a standard functional test (column 14, line 63-column 15, line 5).

As per claim 14: the storing step includes initiating an automated detection system (column 13, lines 3-28).

As per claim 15: a housing having an array of nozzles (figure 4, elements 400 and 410); a printhead memory storing data including a status of at least one nozzle of said array of nozzles (column 9, lines 47-64 and column 14, line 63-column 15, line 5), wherein said printhead is adapted to be installed into a printer having firmware capable of reading said data from said printhead memory and passing said data into a formatter formatting print jobs according to said data (column 14, line 63-column 15, line 5).

**Bruch et al. do not disclose the following claim limitations:**

As per claims 1, 6, and 15: a printhead memory disposed on or within said housing.

**Barbour et al. disclose the following claim limitations:**

As per claims 1, 6, and 15: a printhead memory disposed on or within said housing (figure 3, element 306).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the printhead and methods taught by Bruch et al. with the disclosure of Barbour et al. in order to print a high quality image in an efficient manner and to provide efficient and localized control of the printhead. It is well known to put memories in different locations within a printer.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bruch et al. (US 6517184 B1) and Barbour et al. (US 6476928 B1), and further in view of Kojima (US 6719391 B2).

**Bruch et al. as modified disclose the following claim limitations:**

As per claim 12: a method of making a printer.

**Bruch et al. as modified do not disclose the following claim limitations:**

As per claim 12: compensating for said at least one missing or malfunctioning nozzle by shingling.

**Kojima discloses the following claim limitations:**

As per claim 12: compensating for said at least one missing or malfunctioning nozzle by shingling (column 9, lines 10-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Bruch et al. as modified with the disclosure of Kojima in order to provide a higher quality printed image and to reduce banding.

Claims 1, 4-6, 10, 11, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ujita et al. (US 5506611 A) in view of Bruch et al. (US 6517184 B1).

**Ujita et al. disclose the following claim limitations:**

As per claim 1: a housing having an array of nozzles (figure 11, element 12); a printhead memory disposed on or within said housing (figure 11, element 30); and data stored in said printhead memory (column 16, lines 8-25), said data being indicative of a missing or malfunctioning nozzle (discharge recovery conditions indicate that there is a clogged nozzle).

As per claim 5: the printhead is adapted to use data to format print jobs (column 16, lines 8-25).

As per claim 6: providing a printhead having a housing including a nozzle array (figure 11, element 12) and a memory (figure 11, element 30); and storing data in said printhead memory, said data being indicative of a missing or malfunctioning nozzle (discharge recovery conditions indicate that there is a clogged nozzle).

As per claim 15: a housing having an array of nozzles (figure 11, element 12); a printhead memory disposed on or within said housing (figure 11, element 30); and data

stored in said printhead memory, said data including information on the nozzles (discharge recovery conditions indicate that there is a clogged nozzle).

**Ujita et al. do not disclose the following claim limitations:**

As per claim 1: the data being indicative of a location of at least one missing or malfunctioning nozzle of said array of nozzles

As per claim 4: the printhead is adapted to be installed into a printer having firmware capable of reading said data from said printhead memory.

As per claim 6: storing data in a printhead memory, said data being indicative of a location of at least one missing or malfunctioning nozzle of said array of nozzles.

As per claim 10: the step of installing said printhead having firmware capable of reading said printhead memory.

As per claim 11: the firmware reads said printhead memory and a formatter formats a print job based on the data.

As per claim 13: the storing step includes performing a standard functional test.

As per claim 14: the storing step includes initiating an automated detection system.

As per claim 15: the printhead is adapted to be installed into a printer having firmware capable of reading said data from said printhead memory and passing said data into a formatter formatting print jobs according to said data.

**Bruch et al. disclose the following claim limitations:**

As per claim 1: the data being indicative of a location of at least one missing or malfunctioning nozzle of said array of nozzles (column 9, lines 47-64 and column 14, line 63-column 15, line 5) (the numbers correspond to specific nozzles).

As per claim 4: the printhead is adapted to be installed into a printer having firmware capable of reading said data from said printhead memory (column 14, line 63-column 15, line 5).

As per claim 5: the printer is adapted to use said data to format print jobs (column 14, line 63-column 15, line 5).

As per claim 6: storing data in a printhead memory, said data being indicative of a location of at least one missing or malfunctioning nozzle of said array of nozzles (column 9, lines 47-64 and column 14, line 63-column 15, line 5) (the numbers correspond to specific nozzles).

As per claim 10: the step of installing said printhead having firmware capable of reading said printhead memory (column 14, line 63-column 15, line 5).

As per claim 11: the firmware reads said printhead memory and a formatter formats a print job based on the data (column 14, line 63-column 15, line 5).

As per claim 13: the storing step includes performing a standard functional test (column 14, line 63-column 15, line 5).

As per claim 14: the storing step includes initiating an automated detection system (column 13, lines 3-28).

As per claim 15: the printhead is adapted to be installed into a printer having firmware capable of reading said data from said printhead memory and passing said



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data into a formatter formatting print jobs according to said data (column 14, line 63-column 15, line 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cartridge taught by Ujita et al with the disclosure of Bruch et al. in order to improve the printhead servicing process.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ujita et al. (US 5506611 A) and Bruch et al. (US 6517184 B1), and further in view of Kojima (US 6719391 B2).

**Ujita et al. as modified disclose the following claim limitations:**

As per claim 12: a method of making a printer.

**Ujita et al. as modified do not disclose the following claim limitations:**

As per claim 12: compensating for said at least one missing or malfunctioning nozzle by shingling.

**Kojima discloses the following claim limitations:**

As per claim 12: compensating for said at least one missing or malfunctioning nozzle by shingling (column 9, lines 10-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Ujita et al. as modified with the disclosure of Kojima in order to provide a higher quality printed image and to reduce banding.

***Response to Arguments***

Applicant's arguments filed 4/16/08 have been fully considered but they are not persuasive. Applicant argues that there is no motivation to combine Bruch and Barbour; however, the examiner disagrees. Modifying the location of the memory within a printing apparatus such that the memory is on the printhead allows the printhead to have the ability to access and process certain data and to make their own analyzed and efficient decisions, such as firing and timing decisions.

The applicant argues that the Bruch reference teaches against storing malfunctioning or missing nozzle data in a printhead because, for proper operation, such data is required by other components that act on the printhead. For proper functioning of the printhead, the memory must be in communication with the printhead driver such that the printhead driver generates signals to control the printhead. Modifying the location of the memory within a printing apparatus such that the memory is on the printhead allows the printhead to have the ability to access and process certain data and to make their own analyzed and efficient decisions, such as firing by means of generating drive signals.

The examiner has also added a second rejection in which the printhead memory involves servicing information (recovery conditions). Modifying the disclosure of Ujita et al. with the teachings of Bruch et al. (specifically the nozzle locations) would benefit in the servicing operations such that it would allow the cartridge to use the recovery operation only when necessary by storing the nozzle locations that are inoperative.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAURA E. MARTIN whose telephone number is (571)272-2160. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. E. M./  
Examiner, Art Unit 2853

Laura E. Martin

/Manish S. Shah/

Primary Examiner, Art Unit 2853